

Advanced Coordination Pre-Emergency Planning



Brad Long
Cal-ARP Industry Workshop
Thursday, October 15, 2009

Responding to an Emergency Industry Agency Coordination

- Hazardous Materials Business Plan (HMBP)
- Area Plan
- Planning
 - SOP, Emergency Procedures
 - Drills and Exercises
 - Fire Department, Law Enforcement, Hazmat
- Release Notification
- Public Notification
 - Shelter in Place/ Evacuate
- Responding v. Non-Responding
 - Level of Training, ICS
- Local First Responder Roles/Responsibilities
 - Hazardous Materials Business Plan "Supplement"



Pre-Planning H&SC Chap 6.95

- Title 19 CCR, Div 4, Chap 4
 - Article 2- Release Reporting and Notification
 - Release and Threatened Releases
 - Article 3- Area Plan
 - Pre-Emergency Planning
 - Notification and Coordination
 - Training
 - Public Safety and Information
 - Article 4- Hazardous Materials Business Plan (HMBP)
 - Hazmat Inventory- 55 gal, 500#, 200cu/ft, Site Map, Business Owner Operator, Emergency Contacts, Submitted to AA
 - Emergency Procedures, Training, Not Submitted to AA
- Title 19 CCR, Div 4, Chap 4.5
 - California Accidental Release Prevention Program
 - Descriptions of Safety System's
 - Article 7- Emergency Response Program



Drills and Exercises

- Frequency- Defined in RMP, Annual Typical
- “Exercise The Plan”, Emergency Response Procedures
 - Evacuation Procedures –for a Chemical Release
 - Notification
 - ICS Coordination
 - Public Notification
 - Release Mitigation
 - Hazardous Waste Clean-up
- Include you Local Fire and Hazmat Team
 - In San Diego County Call 619-338-2284
 - Integrated Participation, Site Walk Thru, Tour
- Vary the Scenarios,
 - Table Top, Full Functional
 - Release; Minor, Small, Major

Pre-Planning

- Fire Department
 - Site Visits
 - Meet and Greet
 - Facility layout, ingress, egress, on site resources
 - Pre-Fire Plan
 - Wildland Fire Considerations, State F&G
 - Emergency Mitigation Measures “Hazmat”
 - Evacuation, Shelter in Place
 - MDC, Dispatch Protocol
- Local Hazmat Team
 - Site Layout, Hazmat Storage
 - Safety Systems, Mitigation Systems
 - Responding vs. Non Responding, Joint Entry
 - Possible Mitigation Objectives



Release Notification

- Alarms- On Site
- Sirens for the Public
- 911
 - Fire Department, Law Enforcement
 - Dispatch Pre-plan
 - Local Hazmat
- CUPA/AA
- State Warning Center, OES
- National Response Center (NRC)
- Possibly more: OSHA, Cal F&G, US Fish & Wildlife, Local Storm Water, Coast Guard, RWQCB,.....



Site Evacuation Walking Out the Door?

- Site Notification
 - Alarms, Shouting, PA
- Staff/Visitor/Contractor Accountability
 - Time Cards, Visitor Sign in Log, Staff Phone List
 - Staging Areas
- Shutdown of Critical Processes
- Communications
 - Radios, Cell Phone
- Critical Documents
 - Hazardous Materials Business Plan (HMBP)
 - SOP's, Emergency Procedures, "That special laptop"
- Personal Belongings
 - Purse, Car Keys, Medication



Immediate Protective Actions (Fire & Police)

- Primary Objectives
 - Life & Safety, Environment, Property
- Decision Process
 - Size-up, Objectives, Decide, Act - (SODA) "Repeating"
- Isolate Deny Entry, Establish Zones
 - Building, Facility, Surrounding Area
 - Evacuation, Shelter in Place
- Emergency Medical Treatment
 - Mass Casualty, Emergency Decon
 - Area Plan Annex's; B, D, G, H, L
- Emergency Mitigation
 - Water Fog, Damming, Diking



Evacuate or Shelter in Place

- Will shelter-in-place provide adequate protection?
- Release vs. Threatened Release
- Is there enough time to evacuate?
 - Time is a Crucial Factor
 - Insufficient Time to Evacuate
 - Duration of Release

Communication

- Message
 - How to Shelter in Place
 - Evacuation Instructions
 - Bilingual
 - Red Cross Shelter's



Evacuate or Shelter in Place Decision Process

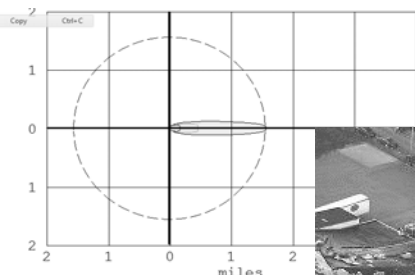
- ❶ **STEP 1:** DETERMINE THE CHARACTERISTICS OF THE RELEASED CHEMICAL
- ❷ **STEP 2:** DETERMINE THE CHARACTERISTICS OF THE RELEASE
- ❸ **STEP 3:** DETERMINE POTENTIAL METEOROLOGICAL CONDITIONS AT THE SITE
- ❹ **STEP 4:** COLLECT DATA ON STRUCTURES SURROUNDING THE FACILITY
- ❺ **STEP 5:** ESTIMATING THE TIME AVAILABLE BEFORE THE AREA IS CONTAMINATED
- ❻ **STEP 6:** ESTIMATING THE TIME REQUIRED FOR IMPLEMENTING PROTECTIVE ACTIONS



Release Example, Evac or SiP?

- ❶ Anhydrous Ammonia
 - Molecular Weight: **17.03 g/mol**
- ❷ ATMOSPHERIC DATA:
 - **Wind: 1 meters/second** from West, at 3 meters
 - Ground Roughness: urban, Cloud Cover: 5 tenths
 - **Air Temp 70° F**, Stability Class: E, No Inversion Height,
 - **Humidity: 25%**
- ❸ SOURCE STRENGTH:
 - Leak from short pipe or valve in vertical cylindrical tank
 - Tank - Diameter: 9 feet, Length: 12.6 feet, **Volume: 6000 gallons**
 - **Circular Opening Diameter: .5 inches,**
 - **Opening is 0 feet from tank bottom**
 - Release Duration: ALOHA limited the duration to 1 hour
 - **Release Rate: 106 pounds/min**, Total Amount Released: 6,340 pounds

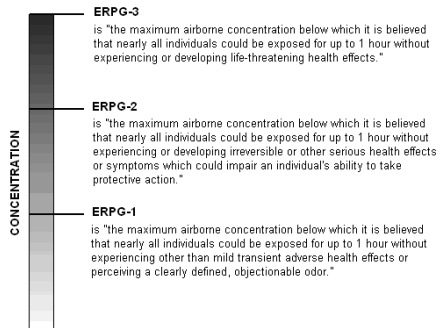
Release Example, Evac or SiP?



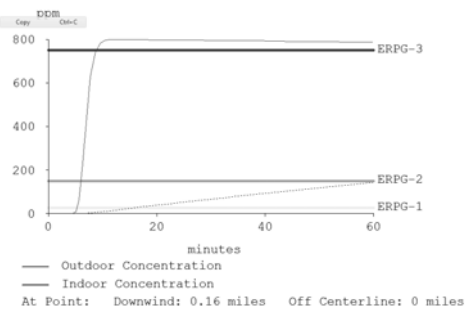
≥ 750 ppm = ERPG-3
 ≥ 150 ppm = ERPG-2
 ≥ 25 ppm = ERPG-1
 Confidence Lines



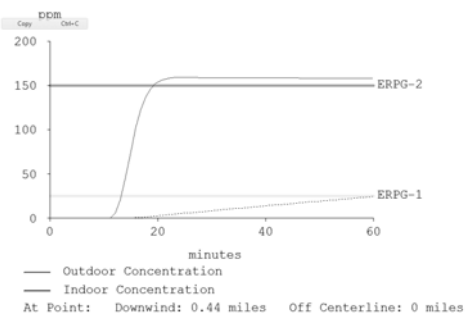
Emergency Response Planning Guidelines



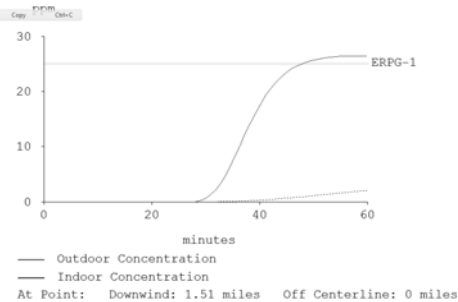
Release Example for Evac or SiP End of ERPG 750 ppm Footprint



Release Example for Evac or SiP End of ERPG 150 ppm Footprint

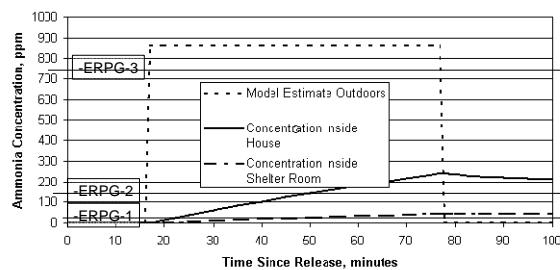


Release Example for Evac or SiP End of ERPG 25 ppm Footprint



Shelter in Place Concentrations

Figure 3: Shelter-in-Place



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There are three types of sheltering:

- **Normal sheltering** is taking refuge in an existing, unmodified building, closing all windows and doors, and turning off all heating, ventilation and air conditioning (HVAC).
- **Expedited sheltering** is taking shelter in a pre-planned site, where, in addition to normal sheltering, plastic sheeting and tape are applied to windows and doors to reduce infiltration.
- **Enhanced sheltering** further reduces infiltration by erecting permanent barriers, such as weather stripping and storm windows (Sorensen 1988; Vogt, Hardee, Sorensen, & Shumpert 1999).



Shelter in Place Instructions

Expedited Sheltering

- Step 1. Move inside a building (house, apartment, or church) immediately.
 - If you are in a car Drive out of the area.
- Step 2. Close and lock all windows and doors.
- Step 3. Turn off all ventilation systems;
 - Turn off HVAC.
 - Other ventilation fans such as in the Kitchen and Bath,
 - Make sure the clothes dryer is off.
- Step 4. Close fireplace damper (if there is a fire in the fireplace, let it burn down without closing the dampers)
- Step 5. Listen to radio or TV for instructions. Do not use the phone the Fire Department may call with instructions. Don't call 911 unless there is an emergency like a fire or serious injury.
- Step 6. *Pick one room in the house to use as a shelter room. A master bedroom is a good choice if it has a bathroom and phone.*
 - Bring in a battery powered radio, cordless phone, some water, some food, duct tape, towels, and plastic sheeting or plastic bags.
 - Once everyone is inside, seal up the windows and doors using plastic sheeting or plastic bags and duct tape and/or damp towels.

Post Shelter in Place

Sound the "All Clear"

- Eventually some chemical will seep into the building and even the shelter room. The toxic chemical may remain inside the building even after the air has cleared outside.
- Emergency response personnel will need to give instructions to the public as to what to do, which could be to ventilate the building or even order an evacuation.

Public Notification

- Sirens /Audio Alarms
- First Responder PA/Loud Speaker
- Emergency Alert System- TV, Radio
- PIO/Media
- Alert San Diego/Reverse 911



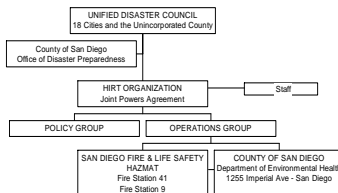
Alert San Diego/Reverse 911

- Third Party Supported-Twenty First Century Communications
- 100,000 calls an hour
- Internet Based,
 - End User Operation, Sheriff Communications
- Contacts
 - Home & Business Phones, Cell and VOIP via resident registration.
 - Selected by Map Interface or Pre-established Lists
- Message Creation- User Specified, Recording, Text to Voice.
- Call Options- Multiple Attempts, Hearing Impaired, Text Messages, Leaves Messages, Caller ID, Option to Repeat, Call Direction
- Reporting- Success- Answered Call, Message, TTY/TTD
- Follow-up Messages-



Hazardous Materials Incident Response Team "HIRT"

- Formed in 1985
 - Joint Powers agreement
- Funded by 18 cities
- Unincorporated County
- Two military bases
- Five Indian Reservations



Hazardous Incident Response Team "HIRT"

Personnel: 44 SDFD & 13 DEH

- All trained as Hazmat Specialists
- 13 California Registered Environmental Health Specialists
- 12 trained as Paramedics
- 6 trained as SWAT Medics
- 6 Response Vehicles



Response to Chemical Threat

➤ Detection & Identification

➤ WMD, TIC's, TIM's

➤ Multiple Technologies

➤ IMS, SAW, PID, GCMS,

➤ Electro Chemical,

➤ Colorimetric Tubes, Chips

➤ Wide Area Air Monitoring



Wide Area Chemical & Radiological Detection

MSA SAFESITE®
Multi-Threat
Detection System/
SAFECON™
Command Center



DEH-HIRT

26

Stand-Off Chemical & Radiological Detection

Detection Capabilities

- Combustible Gas Indicator GGI
- Oxygen Monitoring- for deficient or enriched atmospheres.
- PID (Volatile Organic Compounds- 10.6 IP)
- Chemical Warfare Agents- nerve and blister agents GA, GB, GD, HD, HN, (Sound Acoustical Wave-SAW)
- **Chlorine or Ammonia, (30 Options)**
- Gamma Detection- 0-1000 mrem/hr



SAFEMTX Multi-Threat Detector

Stand-Off Chemical & Radiological Detection

- Wireless Communication 900MHz Frequency Hopping, 1 watt power.
- GPS- Self mapping and location.
- Range ~1mile line of sight, repeater function programming, High Gain Antennas.
- Multi-Power Options- AC, Batteries; Alkaline, or Li Ion, Long Battery Runtime 8 - 24 Hr.
- Multiple Alarm Thresholds- A1, A2, A3.
- Intrinsically Safe.
- All weather Operation.

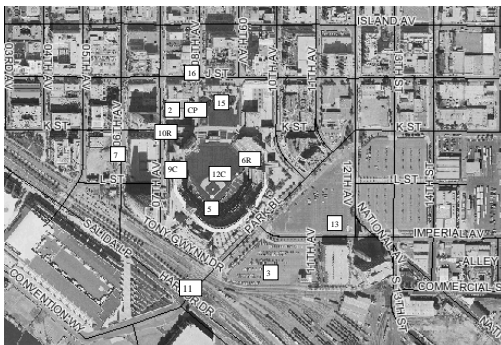


Stand-Off Chemical & Radiological Detection

- Pre-Planning-Public Events/Venues
 - Set-up at large venues Petco Park, Qualcomm, Convention Center, Mass transportation
- Training
 - Metropolitan Medical Strike Team (MMST) Exercises
- Response/Perimeter Monitoring
 - Concurrent Threat Entry Operations
 - Gas Tanker Rollovers
 - Chemical Releases



Pre-Planning/Public Events

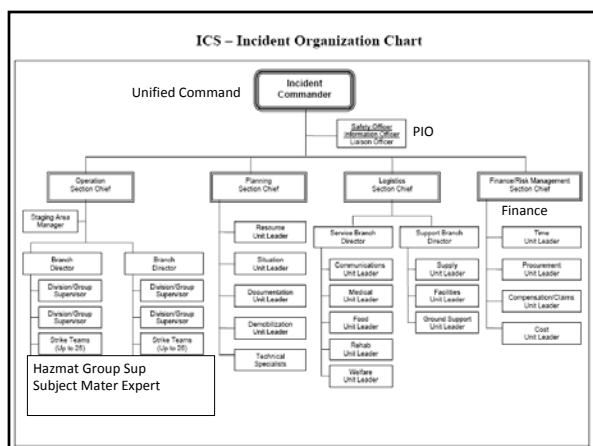




Perimeter Monitoring

Responding v. Non-Responding

- Level of Training
 - Hazmat Tech Level A, B, C,
- Availability of Trained Staff
- Trained Staff- In House or Contractor
- ICS, Unified Command
 - IC Liaison
 - Finance
 - PIO
 - Subject Matter Expert, Entry Team, Joint Entry



HMBP Pre-Planning Supplement

- Information not typically captured in the HMBP.
- Intended to be used by First Responders to mitigate a release, threatened release.
- Provide the responder with a virtual tour of the facility.
- **Brief Description**- the Stationary Source, All Processes regardless of Program Level, Key Safety Systems
- **Table of Key Safety Systems** and their status based on release status.
- **Photos**- document the processing from beginning to end, facility locations of key safety systems.

HMBP Pre-Planning Supplement

Brief Descriptions

- Process Descriptions
 - Beginning to End, Storage Containers, Fittings
- Responding v. Non-Responding
 - Level of Training, Joint Entry
- Facility Access
 - Maps showing all access points.
 - Local Met Data
- Key Safety Systems in Relation to Release Condition
 - Emergency Shutdown, Sensors, Scrubbers, vacuum regulators, ventilation systems, Actuated Valves.
 - Release Status; Minor, Small, Major Release

Key Safety Systems in Relation to Release Condition

Equipment	Condition				System Notes
	Minor Release <1.0 ppm	Small Release >1.0-10 ppm	Major Release >10 ppm	Emergency Button (Photo 10)	
Chlorine Sensors	Available at all times.				<ul style="list-style-type: none"> ➤ 5 Cl Sensors located in the chlorine storage room, ➤ 1 Cl Sensor in the chlorinator room, Photo 32, 33 ➤ 1 Cl Sensor in the evaporator room. Photo 30, 31 ➤ The compressor room and control room do not have sensors ➤ The Chlorine Sensors will automatically activate several safety systems. ➤ The sensors have a range of 1-10 ppm

Key Safety Systems in Relation to Release Condition

Equipment	Condition				System Notes
	Minor Release <1.0 ppm	Small Release >1.0-10 ppm	Major Release >10 ppm	Emergency Button (Photo 10)	
Ventilation System	On	Off	Off	Off	<ul style="list-style-type: none"> ➤ Ventilation system for the building exits straight to atmosphere. ➤ Activates for minor releases for , 1.0 ppm, Shuts off when the scrubber goes on
Scrubber System	Off	On	On	On	<ul style="list-style-type: none"> ➤ Capable of scrubbing the contents of one Full One Ton. ➤ Controls for the scrubber system are available via control panel in front of the scrubber. ➤ Connected to Backup Power, Generator. ➤ See Photos 5, 6,7

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Key Safety Systems in Relation to Release Condition

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	Minor Release <1.0 ppm	Small Release >1.0-10 ppm	Major Release >10 ppm	Emergency Button (Photo 10)	
Product Piping Valves	OPEN	Closed	Closed	Closed	<ul style="list-style-type: none"> ➤ Actuated Valves- Automatically Open/Closed. ➤ Connected to product piping at Tank. Photos 15, 16, 17, 29, Other Valve Photos 18, 21, 22, 23
Window Louvers	Open	Closed	Closed	Closed	<ul style="list-style-type: none"> ➤ Window Louvers may be open or closed automatically or manually. ➤ Manual power switches are located next to each window louver. See Photo 19 ➤ Automatic operation is based on the given condition.

Key Safety Systems in Relation to Release Condition

Equipment	Condition				System Notes
	Minor Release <1.0 ppm	Small Release >1.0-10 ppm	Major Release >10 ppm	Emergency Button (Photo 10)	
Video Surveillance	Available at all times				➤ Video Surveillance (pan, tilt, zoom) inside the chemical storage building is available, and may be viewed from Operations Building Control Room, See photo 27
Digital Scales	Available at all times				➤ Tank contents are gauged using a Digital Scale for each container. ➤ The scales can be read directly See Photo 12 or remotely via either control room.

Key Safety Systems in Relation to Release Condition

Equipment	Condition				System Notes
	Minor Release <1.0 ppm	Small Release >1.0-10 ppm	Major Release >10 ppm	Emergency Button (Photo 10)	
Pressure Gauges	Available at all times				➤ Container & Piping gauges can be direct viewed See Photo 24 or remotely from the control room See photo 29
Chlorine B Kits	Available at all times				➤ There are two Chlorine B kits available, located on the entrances to the Chlorine Storage Room. ➤ Application of a B Kit may require the removal of the Vacuum Regulator or the flexible product lines. ➤ See Photos 14, 16, 19, 20

Key Safety Systems in Relation to Release Condition

Equipment	Condition				System Notes
	Minor Release <1.0 ppm	Small Release >1.0-10 ppm	Major Release >10 ppm	Emergency Button (Photo 10)	
Vacuum Regulators	Available at all times				➤ Vacuum regulators are used on all One Ton Containers in use. ➤ 4 One Ton Containers typically on line at a time. ➤ Regulators require a vacuum to open.

Key Safety Systems in Relation to Release Condition

Equipment	Condition				System Notes
	Minor Release <1.0 ppm	Small Release >1.0-10 ppm	Major Release >10 ppm	Emergency Button (Photo 10)	
Secondary Containment	Available at all times.				<ul style="list-style-type: none"> ➤ The floor below storage tanks have trenching with a 150% capacity of 1 tank. See Photo 8 ➤ Surface area ~1000 sq/ft. ➤ Drain for the trench is closed, may be opened from the outside of the building
Met Conditions	Available at all times.				<ul style="list-style-type: none"> ➤ Two Met Stations are located inside the facility , one in control area, the other in the emergency coordinators office. ➤ Wind conditions within the treatment plane area can be variable.

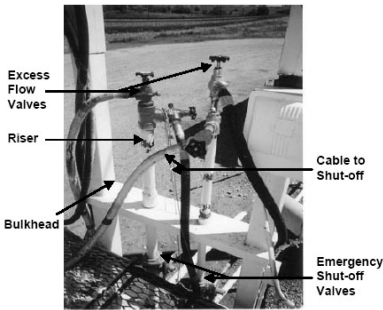
Chlorine Storage Area, 150# Cylinders



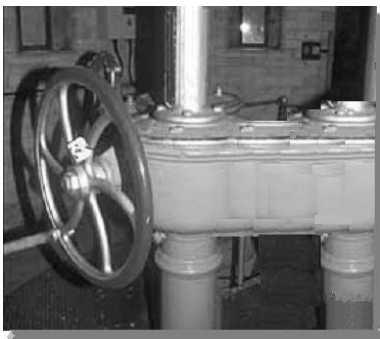
Anhydrous Ammonia Tank



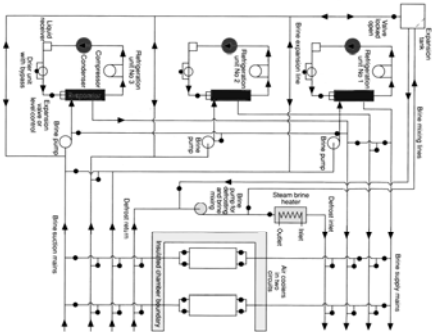
Ammonia Refrigeration System
Exterior Valve Control



Ammonia Refrigeration System
King Valve



Ammonia Refrigeration System
Technical Specifications



EPA Recommended Emergency Response Chart for Ammonia Refrigeration Systems

Example Emergency Response Chart

<u>Ammonia Alarm</u>	<u>Emergency Action</u>
Compressor Room 2W	→ Close Valves C3 & C7
Compressor Room 2E	→ Close Valves C8 & C9
Receiving Dock Area	→ Close Valve A & Door 3
Warehouse Area A	→ Close Valves W5 & W6
Warehouse Area B	→ Close Valves W7 & W8

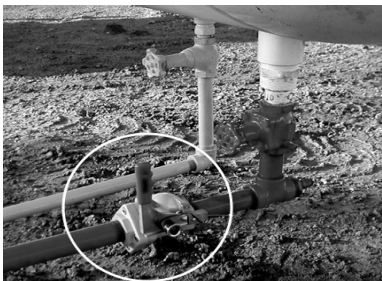
AQUEOUS AMMONIA STORAGE TANK



Ammonia Storage Tank, 30% Aqua

Secondary Containment 150% Tank Capacity, 650 sq/ ft

AQUEOUS AMMONIA STORAGE TANK



● Emergency Valve, Product Piping

Photo 1- Chlorine Storage Building



- Chlorine Storage Building as seen from the Facility Operations Building
- The storage building is ~100 yards North of the Operations Building.
- The building is constructed with non combustible materials, fire suppression; the roof is steel with rock and asphalt coating.
- The tank(s), and Evaporator room are ducted to the scrubber system. The control room and the chlorinator room are not, however these rooms are not likely to have a release.

Photo 2- Chlorine Storage Building



Entrance to the Chlorinator Room
Entrance to the Evaporator Room
Entrance to Chlorine Storage Room
Emergency Shower

Photo 3- Entrance to the bulk Storage Room



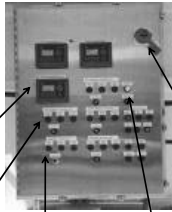
Light Switch for interior Lights
Need Key to open

Photo 4- Chlorine Scrubber



Secondary Containment
Scrubber Controls
Emergency
Shower
Capacity to scrub the contents of 1 One Ton

Photo 5- Scrubber Control Box



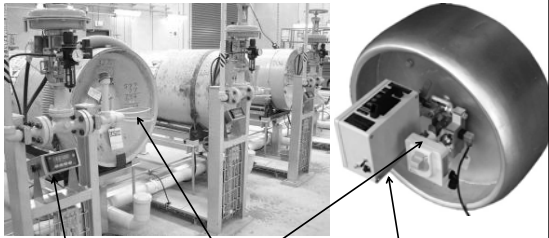
System Status
Pump Controls
Vent Controls
Manual On/Off
Power Switch

Photo 6- Bulk Chlorine Storage



Chlorine Containers On Line
Full and Empty Containers

Photo 7- Chlorine Cylinders On-line



Scale Display Vacuum Regulator Actuated
Valve

Photo 8- Chlorine Evaporators



Chlorine Evaporator Liq Chlorine Lines Green Gas Chlorine Line
Yellow

Where is Waldo?



Summary

- Plans And Emergency Procedures
 - Review, Update, Exercise
- Drills and Exercises
 - Annually, Routinely
 - Vary the Scenarios
 - Include First Responders
- Photo Document/Virtual Tour
 - HMBP Supplement